

Ortho Eyes

Tony Andrioli

Business IT & Management

- Kasper van der Hoofd
- Vincent van den Oord
- Luke de Keizer

Applied Mathematics

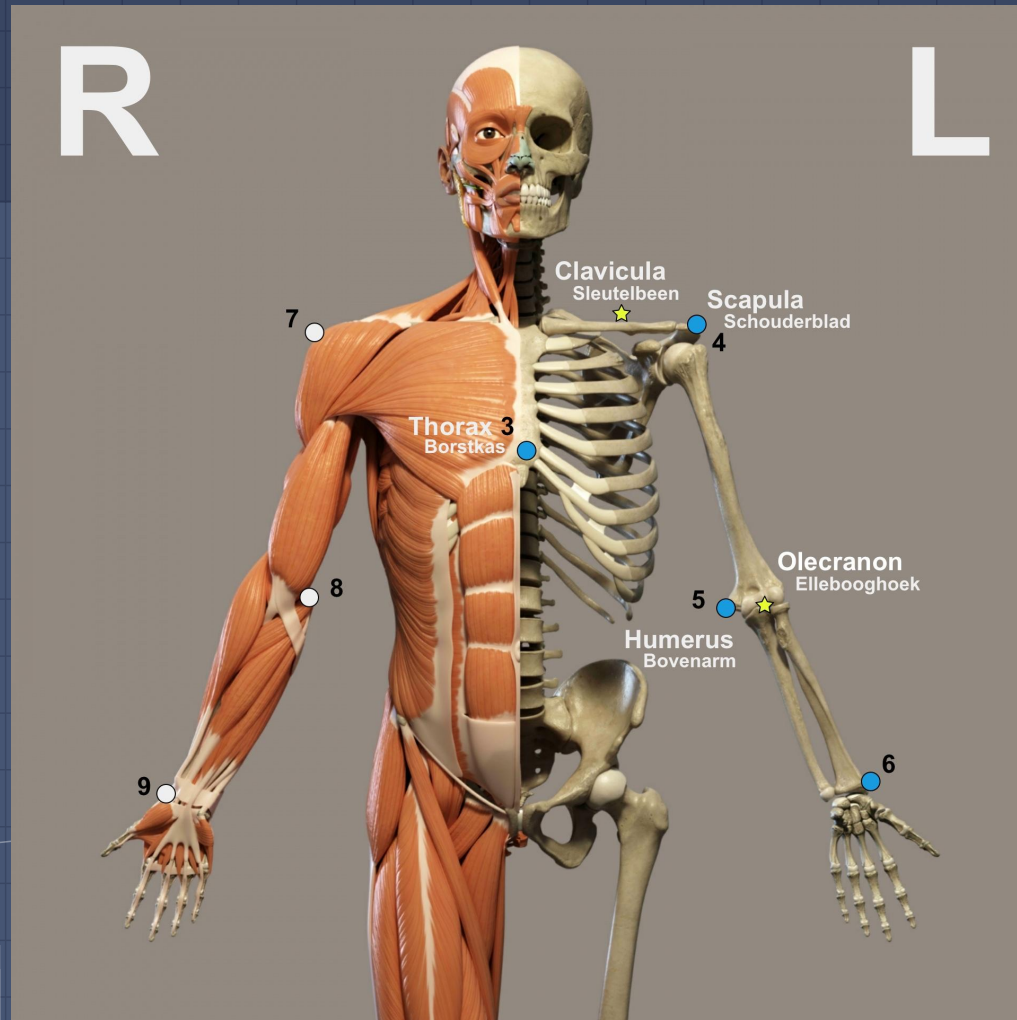
- Rogier Zitman

- Introduction
- Approach
- The Data
- Accomplishments
- Problems
- Next sprint



Introduction

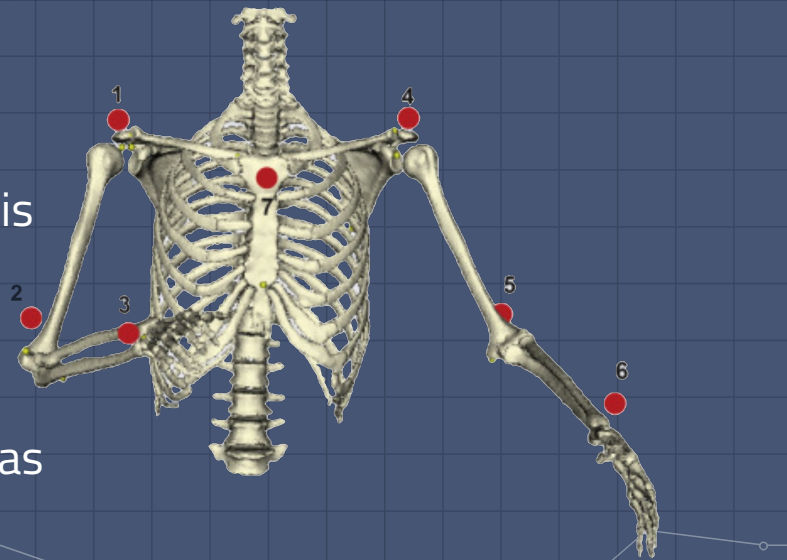
- J.H. (Jurriaan) de Groot, LUMC
- Mobility of the shoulder joint
- Two datasets
 - Sensordata (raw)
 - Cleaned data



The data

The data is handed over in 2 forms:

- ▣ RAW sensor data
- ▣ Cleaned sensor data: Location information is lost, rotation information is translated into angles of bones.



Research on the mobility of the shoulder joint has been done on several patient groups. The available data is an anonymized version of the recorded data.

The questions

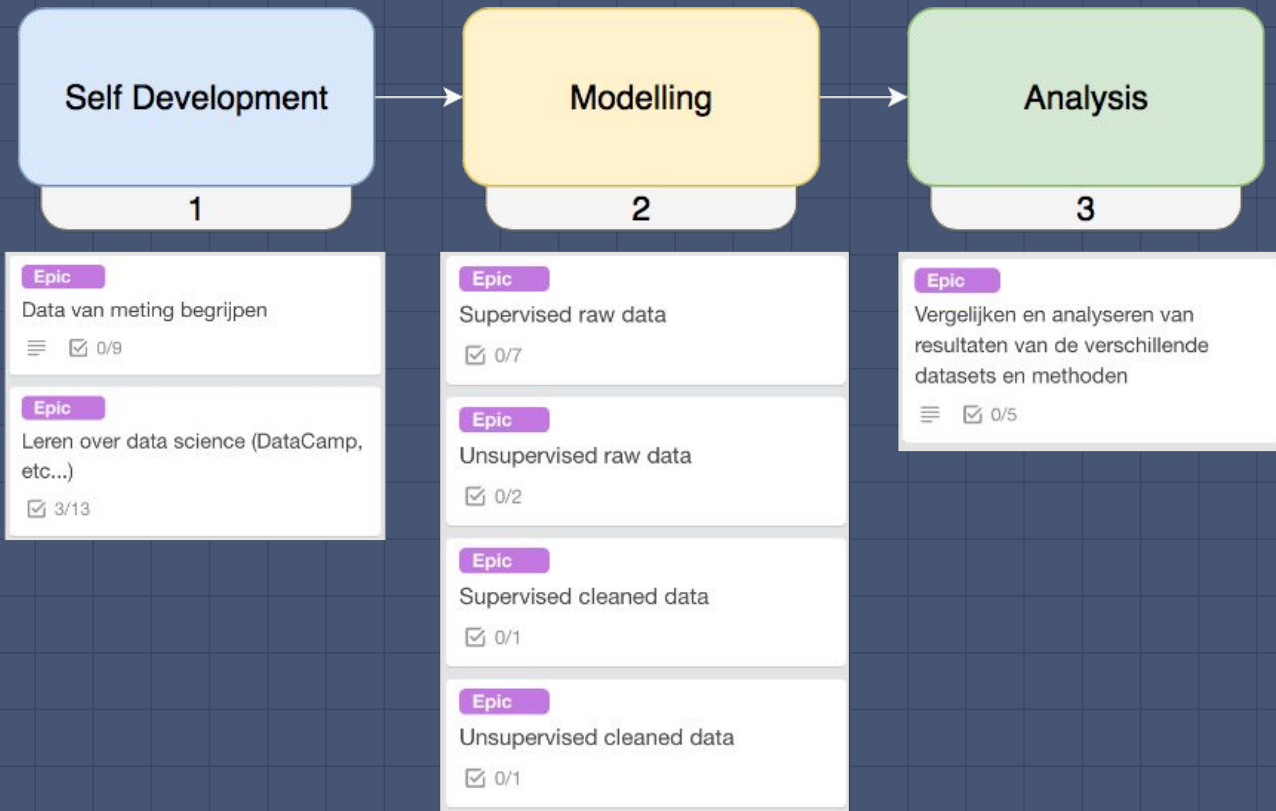
- Research has been done on different patient groups. But it is unknown to what extent the data can be used to distinguish these patient groups. Or as put by Kolk et al., (2017):

“investigate whether kinematic analyses of shoulder motion are useful for diagnostic purposes.”

In data science terms: make a classifier to differentiate the patient groups.

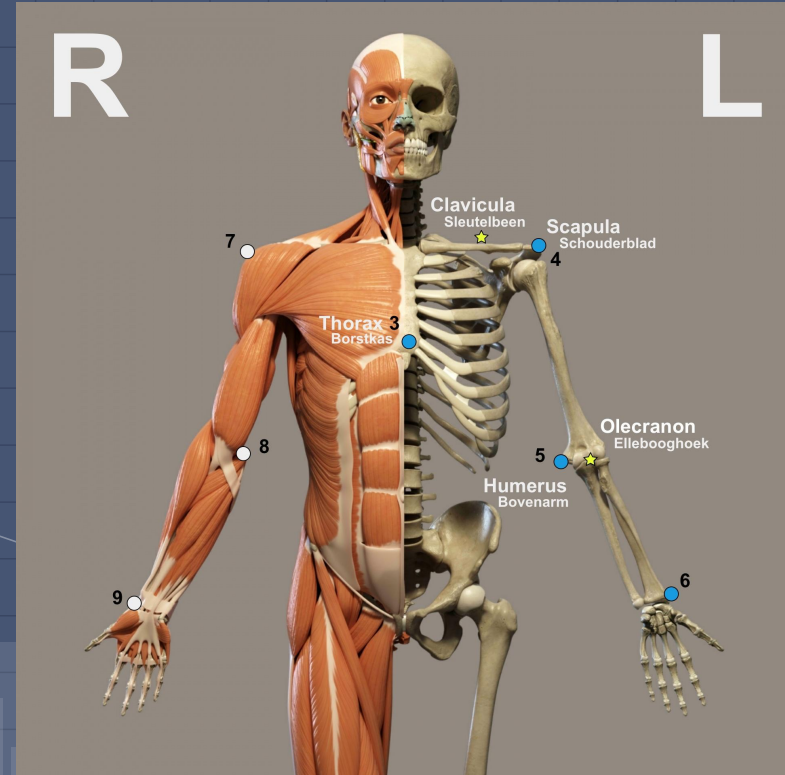
- What parameters contribute the most to this classifier.
 - Can the value of these parameters be measured more easily in the future?
- Is the assumption that the location data is irrelevant correct?

Approach



[Epic] Understanding the data

- Medical jargon
- Anatomy of the human shoulder and arm
- Cleaned data → complete dataset
- Sensordata (raw)



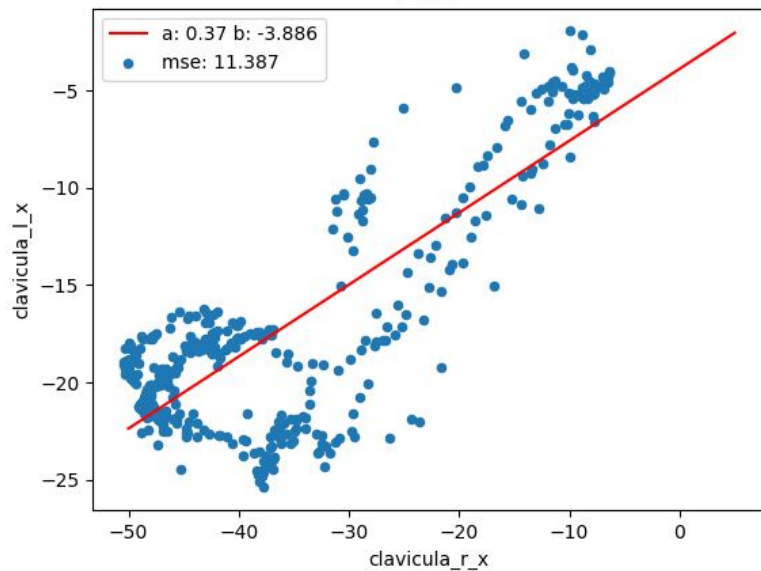
This week's accomplishments

- Practiced Python (with DataCamp)
- The Coursera machine learning course
- Meeting with de Groot
- Cleaned data
 - Implementing linear regression
 - Standard deviation
 - Mean squared error
- Raw data
 - Calculating the elbow angle

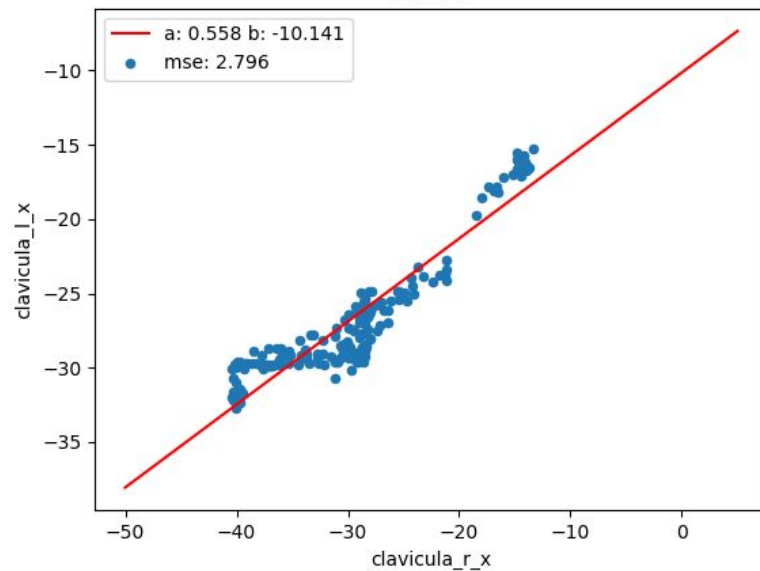
Symmetry

Per patient

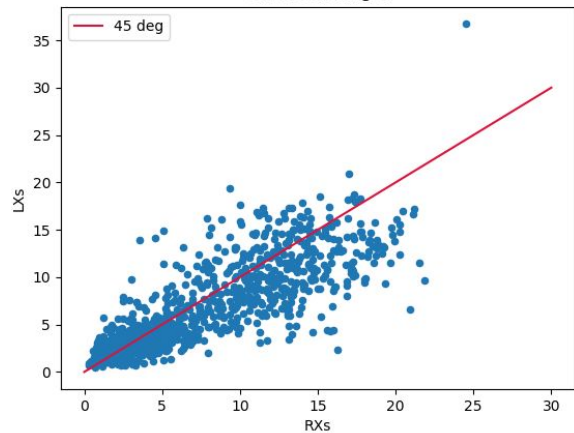
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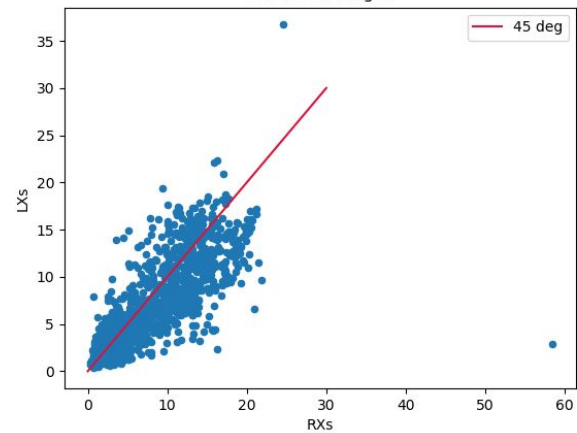
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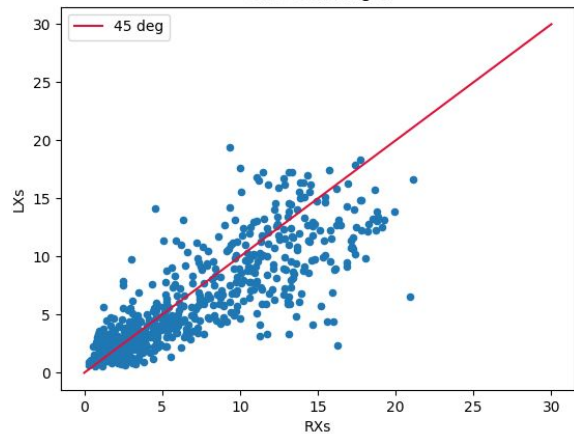
Cat1 Oefening 4



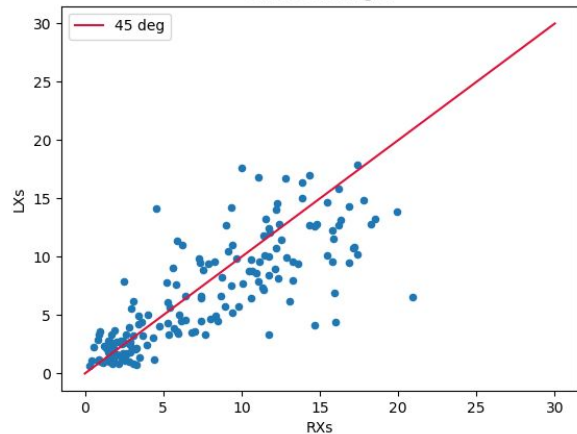
Cat4 Oefening 4



Cat3 Oefening 4

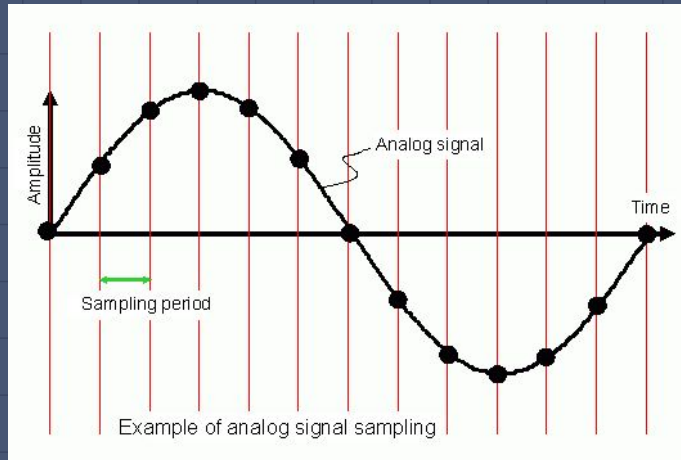


Cat2 Oefening 4



Problems

- Carlijn Konings
- Data
 - Sample frequency is not constant
 - Difficulty using regression techniques for the analysis of time series
 - Raw dataset is not available



Next sprint

- ▣ Visualizing more data
 - Linear regression techniques
 - Symmetry
 - Difference between each category





Any questions or suggestions?